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# Amateur Radio

JOURNAL OF  
THE WIRELESS  
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AUSTRALIA

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## EDITORIAL



## AMATEUR ADVISORY COMMITTEES

In the same way that regulations for driving motor vehicles, flying aircraft, filing income tax returns and the like have of necessity to be "policed," the regulations under which Amateurs operate have also to be supervised to insure that the licensees abide by the terms of their license. It seems inherent in human nature in every country in all walks of life wherever people congregate as a community to carry on the daily task of living, that some form of superintendence of the community laws and regulations is necessary.

Before World War II, a committee of Departmental Officers and Amateurs in each Capital City, known as a **Vigilance Committee**, was set up to maintain some form of discipline in the operating of Amateur transmitting stations. Up to a point these Committees were satisfactory, but left much to be desired insofar as the Institute was concerned because they savoured somewhat of a little "gestapo," or, if not that, something bordering on a system which left itself open to severe criticism although doubtless well-being was generally intended towards those who fell within its clutches.

After the cessation of hostilities when Amateurs were again licensed, the Institute gained representation on a similar committee set up in each State of the Commonwealth to become known as the **Amateur Advisory Committee**—the name currently given to it today.

The Amateur Advisory Committee in each State is composed of Officers of the Wireless Branches of the Postmaster-General's Department, pre-

ferably three transmitting members of the Wireless Institute of Australia and three licensed Amateurs to represent the non-Institute Amateurs. Where the full complement cannot be obtained, the numbers can be juggled to suit the Chairman of each Committee, the Chairman being an Officer of the Department. In addition to these members, the Department can at its discretion appoint observers in country areas.

The Committees meet regularly and discuss the conduct of Amateur affairs and generally control the activities of those who have that human tendency to stray off the path of good operating and commit breaches of the Regulations. In between the meetings of the Committees the members and observers spend many hours monitoring the bands, warning and advising any Amateur who errs rather than report him to the Chairman. In this way petty "law breakers" are given the opportunity to correct their equipment faults, operating irregularities, or what-have-you without meeting with Departmental pro forma's which result in a blot on the copy-book of the licensee.

The Amateur Advisory Committee system has been operating since the war, but it has been gradually gaining a reputation for being a sort of "secret police organisation" because its members have been shrouded in mystery and never known to the Amateur fraternity. Elsewhere in this issue of "Amateur Radio" you will find a list of the names of the Amateurs who comprise the mem-

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# NOTES ON V.H.F. CONVERTER DESIGN\*

## Some Practical Hints for Improving the Performance of Crystal Controlled Converters

THE basic reason for the use of a converter is to extend the frequency range of a communications receiver to bands where the owner of the receiver wishes to operate. Various forms of v.h.f. converters have been used with Amateur receivers for many years, but only recently have they begun to achieve a high state of perfection.

A major drawback of v.h.f. converters in general has been instability in the local oscillator, resulting from mechanical vibration or long-term thermal effects. In order to circumvent this difficulty, the use of crystal controlled injection sources has come into vogue. The higher the frequency the more difficult is the design of a variable frequency oscillator, so though crystal controlled converters for all Amateur bands have been described, their greatest use has been found on 50 Mc. and higher bands.

The use of crystal control in the converter, though it makes possible a high order of stability, introduces other complications. These revolve around the fact that, with a single injection frequency, the intermediate frequency must be varied to effect a tuning range. The r.f. portion of the converter must thus be broadbanded in some way, so that its gain will be constant across the band for which it is designed, yet it must be made to reject signals on all frequencies outside the desired range insofar as possible.

Some crystal controlled converters that have been described make use of rather inefficient broadbanding methods. An example is the use of single-tuned coupling circuits damped with shunt resistors to broaden their frequency response, as shown at the top of Fig. 1. This is simple circuitwise, but it produces a passband that is far from the ideal. It achieves broad response at the expense of gain, and the passband is such that interference from strong signals outside of the desired frequency range is a problem. On the other hand, we have found that use of several double-tuned overcoupled circuits as shown in the lower portion of Fig. 1, results in an almost ideal flat-topped passband characteristic. High Q coils of proper form factor, oriented for minimum capacitive coupling between stages, make possible this desirable response without an excessive number of circuits. It is obvious that this technique is going to be effective in reducing the amplitude of adjacent frequency signals from strong local stations and interference from the unwanted harmonics of the crystal oscillator or doubler stages in the converter. The tendency to cross-modulation from stations located outside the passband is reduced, and higher gain is obtained at the desired frequencies.

Probably even more annoying than the cross modulation trouble that is found in many crystal controlled converter designs is their spurious response to signals outside the desired frequency range. It is quite common, in tuning

● We have had numerous requests to re-print the following article from "QST" on V.h.f. Converter Design, and as this type of v.h.f. reception is used by most Hams, here it is.

**Crystal Controlled Converters** are becoming more popular among v.h.f. men every day, but unless they are carefully designed their considerable response to signals outside the intended frequency range may make them something less than an unalloyed blessing. Here, the authors describe simple means for reducing spurious responses in v.h.f. converters, while at the same time maintaining uniform high sensitivity across the desired tuning range.

the four megacycle range covered by the 2 metre band, for example, to find many interfering signals in addition to the desired Amateur stations. These may be the sound or video carriers of local television stations, taxi cab or other mobile service stations, operating in the frequency range that serves as the intermediate frequency, or unmodulated signals resulting from harmonics of the receiver oscillator. All except those in the last category can be minimised or eliminated completely by employing suitable converter design techniques.

One of the purposes of this article is to describe means of overcoming these weaknesses of crystal controlled converters for 144 Mc. while at the same time achieving a high order of sensitivity and stability. The 2 metre band is used as an example for several reasons, though the same principles may be applied to other frequencies in the v.h.f. range. Reception at 144 Mc. requires multiplication of the crystal oscillator frequency. A converter for this band is quite susceptible to the spurious response troubles mentioned above because of its location in the spectrum between two high powered broadcasting services (f.m. and t.v.) and close to many aircraft and mobile frequencies. In addition, it requires the use of low-noise r.f. amplifier techniques as the frequency is high enough to make receiver noise one of the major limiting factors in weak signal reception.

### R.F. AMPLIFIER CIRCUITRY

It is well known that the first r.f. amplifier in a good design controls the sensitivity, or more accurately, the noise figure of the entire system. In the specific design in question it was decided to use one of the new low-noise dual triodes, such as the 6BQ7A, the 6BK7 or 6BZ7. The first r.f. amplifier circuit is the so-called cascode or driven grounded-grid arrangement shown in Fig. 2. This provides high gain, low noise figure, excellent stability, and ease of adjustment.

Many variations of this circuit have been devised, and nearly all show complicated neutralising methods for achieving the lowest possible noise figure. In the case of a circuit to be used only over a narrow band of frequencies (it should be noted that the 2 metre band is actually narrower than a single television channel), fussy neutralising arrangements can be dispensed with, and a single small coil used to advantage. This inductor is connected between the plate of the first triode section and the cathode of the second, and is designed to be resonant with the input capacitance of the grounded-grid section. This dual triode circuit has a noise figure under 4 db above thermal. When it is used with a suitable pentode r.f. amplifier following, the over-all noise figure can be just slightly in excess of 4 db, which is quite good at these frequencies.

Note that a second r.f. amplifier using a pentode (6AK5 or 6CB6) is suggested. If the mixer follows the first r.f. amplifier directly the noise figure will not be as good, and the operating conditions for the mixer become more critical. The intermediate r.f. amplifier also permits the use of more tuned circuits at the signal frequency and hence improves the rejection of adjacent signals and those on the intermediate frequency. In this respect, the additional pentode r.f. stage is superior to the use of an i.f. amplifier stage in the converter as a means of building up the gain. The latter tends to increase difficulties with signal pick-up at the intermediate frequency, whereas the second pentode stage is effective in reducing it. If control of the over-all converter gain is desirable, it can be accomplished by means of a cathode-bias gain control in the pentode stage in the same manner as is commonly used in i.f. amplifier stages.

Double-tuned circuits are used between the triode and pentode amplifiers, and between the pentode amplifier and the mixer. This is a very important feature, making possible the highly desirable over-all response shown in the lower portion of Fig. 1. The coupling circuits can best be aligned by the use of a sweep-frequency generator, but this is not necessary. Entirely satisfactory performance can be obtained by judicious use of a grid-rip meter and a final touch-up using on-the-air signals. The gain of the unit is adequate to give very good performance, even with some mistuning.

### PENTODE OR TRIODE MIXER?

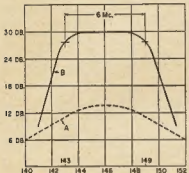
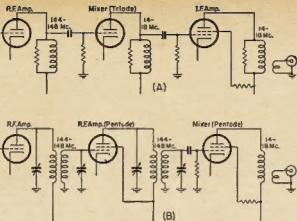
Triode mixers are commonly used in v.h.f. converter service in preference to pentodes because of their generally lower noise figure. This is an important consideration only when no r.f. stage or an ineffective stage is used. The performance of the triode-pentode combination already described is such that the mixer following it has substantially no effect on the noise figure of the system, so the following desirable features of a pentode mixer can be made use of.

\*Reprinted from "QST," February, 1955.



Fig. 1.—Basic converter circuits, showing methods of broadbanding. Circuit A has resistive loading, resulting in the broad but low-gain response shown by the dotted line in the graph below. An i.f. amplifier stage is needed for satisfactory over-all gain.

In B, double-tuned circuits between the r.f. and mixer stages to give the desirable characteristics of Curve B. The first stage, a triode, is followed by a pentode to build up gain. The mixer can be either pentode or triode. Gain is equal to the above, without an i.f. stage, and rejection of unwanted signals is greatly improved.



Properly designed, the pentode mixer is less susceptible to oscillation trouble than a triode. It affords better isolation between r.f. and i.f., and consequently contributes to the ability of the converter to reject signals on other than the desired frequency range. The better pentodes have higher conversion gain, making an i.f. amplifier following the mixer unnecessary. Pentodes generally require less injection voltage than triodes, making the work of the oscillator-multiplier chain easier.

The design of a mixer to follow an effective r.f. amplifier system is not critical. Generally speaking, the principal consideration is to set up the operating conditions of the pentode so that it draws the lowest plate current consistent with satisfactory output.

#### OSCILLATOR-MULTIPLIER CONSIDERATION

The oscillator portion of the converter uses a crystal operating on its third overtone, permitting selection of the crystal from readily available frequencies in the 7 to 8 Mc. range. The actual frequency is dependent on the intermediate frequency selected. Choice of the i.f. is a matter for later discussion. The final multiplied output should be 144 to 148 Mc. minus the desired tuning range of the low-frequency receiver. An example is an injection frequency of 130 Mc., allowing the receiver to be tuned from 14 to 18 Mc. to cover the 144 Mc. band. This is achieved by a 7,222 Kc. crystal operating on its third overtone, which is then multiplied by a factor of six.

Many other possibilities exist, though this one provides for the use of a low-cost crystal and a simple multiplying chain. It is desirable to keep the frequency multiplication to a minimum, as the more multiplication there is involved, the more complex becomes the signal fed into the mixer tube, and consequently the greater the danger of mixing the incoming signals with frequencies other than the desired one, resulting in "birdies" across the band.

A typical case develops if high-order harmonics, other than the desired 150 Mc., get into the mixer tube together with the sound or picture carriers of t.v. Channel 7, which can be very disconcerting if a transmitter is operating on that channel locally. There are many other possibilities, of course, but suffice to say that it is highly desirable to minimize the presence of other than the desired frequencies at the mixer grid.

Occasionally, it will be found that local interference problems can be solved by suitable choice of multiplier frequencies following the crystal oscillator, selecting these frequencies so that none is higher or lower than a local service by the amount of the intermediate frequency. Normally the stage following the overtone oscillator multiplies the frequency by two, and another stage runs as a tripler. This sequence is desirable in the presence of a strong t.v. signal on Channel 7, but there may be other cases where the order of frequency multiplication can be reversed to advantage.

In addition to choice of frequency multiplication according to local conditions, it is important that adequate filtering of unwanted harmonics of the crystal is provided in the plate circuit of the last frequency multiplier. This

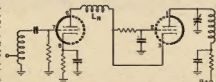


Fig. 2.—Modification of the cascade circuit suitable for 2 metre r.f. amplifier service. The coil  $L_1$  is resonant at the middle of the band with the input capacitance of the second triode section. Its adjustment is not critical. Suitable tubes are the 6BQ7A, 6BE6 or 6BE7.

can be done with undercoupled double-tuned circuits, but in this instance it has been found adequate to use a high Q plate circuit loosely coupled to the mixer grid by means of an inductive link.

#### MECHANICAL LAYOUT

Several desirable objectives can be attained by proper layout of components for a crystal controlled converter. There are two general approaches to the problem of adequate isolation and reduction of feed-back. One is to build compactly and resort to rather complicated shielding and filtering. Another is to build somewhat larger, in order to provide space for a layout that will achieve the same ends.

Stability, that is freedom from feed-back, is accomplished in the r.f. portion of the converter by careful positioning of the r.f. inductors, and phasing of the windings for minimum unwanted coupling between stages. Capacitive coupling between r.f. stages is held to a minimum by designing the r.f. inductors so that their hot connections (to plate and grid) occur at opposite ends of the coil structure. Components in the oscillator-multiplier chain are so placed as to prevent strong local fields therein from adversely affecting the performance of the r.f. portion.

Complete shielding from strong external fields is important, as is the prevention of signal pick-up at the intermediate frequency by any portion of the converter circuitry. This is achieved in a very simple manner by building the converter entirely on a metal plate that is then fitted to a chassis or metal-lined box to complete the metal enclosure. Connection from the converter to the communication receiver should be made with co-axial line, the outer conductor of which is connected to the case of the converter and to the receiver shielding. In the case of extremely strong local signals on the intermediate frequency, it may be necessary to add a shielding box around the receiver antenna terminals.

#### DESIRABLE RECEIVER CHARACTERISTICS

The communications receiver with which the converter is used plays an important part in the over-all performance of the v.h.f. receiving system. Desirable receiver attributes could be stated in general as follows: The receiver should have a very low image rejection in the frequency range that is to be used as the i.f. band for the crystal controlled converter. It should be well enough shielded to prevent direct pick-up of signals in the i.f. range. The receiver oscillator and beat frequency oscillator should be stable, if maximum advantage is to be derived from the use of crystal control in the converter. The tuning range that is to serve as the intermediate frequency should have sufficient bandwidth so that signals may be tuned in easily and spotted readily as the receiver is tuned across the i.f. range. Some receivers are deficient in this category, particularly those that have separate bandwidth and general coverage dials.

The local oscillator of the communications receiver should be of low amplitude, be thoroughly shielded and of

low harmonic content, and preferably applied to an inner grid of a pentagrid type mixer. When this is done, the oscillator voltage is effectively isolated from the signal input grid voltage by means of the screen. It is especially important that there be no oscillator voltage appearing at the antenna input terminals of the receiver, for such voltages even at very low amplitude will cause "birdies" in the tuning range.

It is not necessary that the receiver be outstandingly sensitive; in fact, it may be desirable to have less than the usual sensitivity, as the converter has quite high gain in its own right.

If the receiver has inadequate image rejection (less than 1,000 times) at the frequency chosen for the converter output, repeat signals will appear at twice the receiver I.f. away from the main response. That is, if the communications receiver I.f. is 455 Kc., the 2 metre signals will repeat 910 Kc. away from the proper frequency. This is a characteristic of the communications receiver, and nothing can be done about it in the converter. In general, it may be said that single conversion receivers having one r.f. stage or none at all will have inadequate image rejection in the 14 to 18 Mc. region. Single conversion jobs with two tuned r.f. stages will be much better, but double conversion receivers with a higher first intermediate frequency are the best of all.

If the converter is to be used with inexpensive receivers having poor image rejection at 14 Mc., better results will be had with a lower converter I.f., such

as 7 Mc. Using 14 to 18 Mc. has a special advantage for 144 Mc. converters, however—it allows direct reading of frequency from the receiver tuning dial, 14 Mc. being 144, 15 Mc. 145, etc.

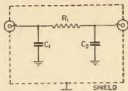


Fig. 3.—Simple low-pass filter for use in keeping receiver oscillator energy from entering the converter through its output cable. C1 and C2 are about 20 pF., R1 should be 100 to 200 ohms.

Where energy from the receiver oscillator is radiated through leads to a separate power supply, or as a result of inadequate shielding, harmonics of the oscillator frequency may cause many fast-tuning birdies in the tuning range. The rapid-tuning characteristic identifies them as harmonics, the speed of tuning being related to the order of the harmonic. One otherwise excellent receiver that is troublesome in this respect may be corrected by the use of shielding over the power supply cable and filtering of the individual leads where they come out of the receiver. A simple low-pass filter such as is shown in Fig. 3 may help in minimising this trouble in cases of inadequate oscillator shielding. This should be inserted in the line between the converter and the receiver input terminals.

## PERFORMANCE

A typical 144 Mc. converter based on the design thoughts here discussed will have a noise figure of 4 to 5 db, depending on the tubes used. Rejection of spurious signals will be a minimum of 1,000 times, and will be that low only on signals around 116 Mc., a little-used frequency that should cause no particular difficulty. Response to signals in the 14 to 18 Mc. range, often troublesome in crystal controlled designs, is too low to be measured; in other words, in excess of 100,000 times.

The response in the region of the 144 Mc. band, shown in Fig. 1, is essentially flat across the band itself, dropping sharply a short distance from either band edge.

Though the 144 Mc. band is used as an example, the same principles have been applied successfully to bands from 28 to 420 Mc. By suitable attention to minimising spurious responses, the stability of crystal control and the advantages of broadband design can result in a quality of reception on these bands that is available through no other means.

## ACCURATE FREQUENCY TRANSMISSIONS FROM

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The next Accurate Frequency Transmission will take place on Thursday evening, 27th Aug., 1953, on the 3.5 Mc. band. Details of the operating procedure and times of operation will be found on page 6 of the February, 1953, issue of this magazine.

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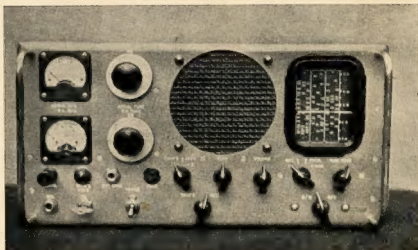
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## AMATEUR TELEVISION

## PART TWO—DESCRIPTION OF EQUIPMENT

BY E. CORNELIUS,\* VK6EC

## FLYING SPOT SCANNER

The Vok112 cathode ray tube, used as a scanner provided, the only source of illumination for the object being viewed. Thus the brilliance of the spot must be high, and for reasons shown below, the scanning spot must be as small as possible. This entails an e.h.t. supply of the order of 3 kilovolts. This high voltage, together with the design of the tube, gives a very low deflection sensitivity, being 0.25 mm. and 0.14 mm. per volt, thus necessitating deflecting voltages of the order of 500 volts per peak is required, and somewhat less vertically.

To provide this, necessitated the use of 6V8 tubes in push-pull in each amplifier. The anode loads had to be reasonably low (25,000 ohm) to preserve the rapid flyback of the horizontal sawtooth (5,250 c.p.s.). A higher anode load would result in capacitive shunting of the sawtooth potentials, and curvature at the commencement and end of flyback.

A long tailed amplifier (cathode coupled) is used for the vertical deflection, but for horizontal deflection, a 6J5 phase splitter is used in order to obtain the maximum from the 6V6 deflection amplifiers.

gauge g.i. shields were found to be more effective than a heavy pipe. They are spaced about  $\frac{1}{2}$ " apart.

The whole is enclosed in an aluminum case, with the controls (shift, focus, etc.), brought out at one side. This leaves the tube face end free for mounting a transparency or lens system. The power supply is external, and all power is brought in by cable. Incidentally, the three kv. e.h.t. is brought in the main cable (pushback wire, and Amphenol octal plugs) without any sign of arcover, or brush discharge.

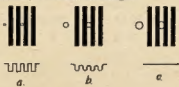


FIG. 3. EFFECT OF SPOT SIZE

**SPOT SIZE**

The flying spot must be very small, as this can be the limiting factor in both horizontal and vertical resolution. For example, taking a bar pattern of

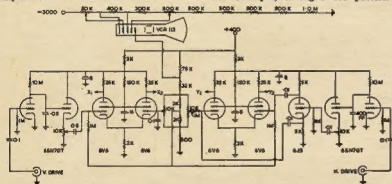


FIG. 2. FLYING SPOT SCANNER

The inputs to the discharge tubes from the sync. signal generator are short duration positive going pulses of about 25 volts peak. A 6SN6GT tube and 6X4 tube are used for each discharge tube and its cathode follower. Cathode followers are used in order to provide a low impedance point for gain control, to set the dimensions of the raster. Balanced shift controls are provided in order to avoid astigmatism. For the same reason, the mean plate potentials of the deflection amplifiers, and the final anode potential of the VCR112 were adjusted to match within 5 volts. This keeps the spot well focussed over the whole of the screen.

A circuit diagram of the flying spot scanner is shown in Fig. 2.

In order to minimise electromagnetic and electrostatic pick-up by the c.r.t., a double sheet metal magnetic screen is fitted around the tube barrel. Two 24

the form shown in Fig. 3a, for a spot smaller in diameter than the width of the bars, the output signal, which is proportional to the instantaneous light, will be an approximation to a square waveform as shown, and the resolution will be excellent.

For a spot wider than the bar, as shown in Fig. 3b, at any instant, the spot will be over both part of a black and a white bar. The signal will be of lower amplitude, and reproduced as shades of grey, rather than black and white, and the resolution will be poor.

For a spot equal in width to a bar and space, the light output will be constant, and no signal will be received. This point is termed the first zero frequency (of the output wave), and is the limit of resolution due to spot size. In practice, it is possible to apply electrical compensation up to about 90% of the first zero frequency. See Fig. 3c.

The screen of the VCR112 has a rather rough matt finish, causing some halation, and an effective enlargement of the size of the spot. No further reduction of spot size beyond that already obtained, seems to be possible, so that for this tube, 250 lines seems to be the limit of resolution.

### SCREEN PERSISTENCE

After excitation of one small element of the phosphor by the electron beam has ceased, as the spot moves on, the light from this element, ideally, should cease instantly. The time taken for the phosphor glow to be reduced to 10% of its excited intensity is termed the screen persistence.

It will be seen that if the persistence is long, the effect will be that the spot has a "tail" of length proportional to the screen persistence, and the writing rate of the beam. Light will be coming from parts of the screen other than the part excited at any instant, by the beam, and signal proportional to the total illumination of this whole area will be obtained from the photocell. If the effective elongation of the spot is considerable, fine detail in the picture will be masked, and resolution lost.

The persistence of the VCR112 is fairly short, of the order of 30 usec. This is still far too long for resolution of the order of 2 usec., but fortunately considerable correction can be applied in the video amplifying stages, and will be described later.

As the light from the screen is a continuous spectrum, giving the effect of white light, I considered it possible that different colour components of the light might have differing persistence. Experiments with colour filters showed that a blue filter would decrease the effect somewhat, and a green filter would increase it.

The method used was as follows:—

The flying spot scanner raster was covered with a mask having a slot to expose a small area. Ideally, the signal received would be a square wave, as shown in Fig. 4.



FIG. 4. IDEAL RESPONSE - SLOT

The oscillograph was connected to trace the waveform at the output of the photocell, and was of the form shown in Fig. 5a.

Three points, marked A, B and C, show departure from the ideal.

Curves A can be accounted for by the shape of the leading edge of the spot, and probably would not exist if a square spot could be used for scanning. The curvature is so slight as not to effect the resolution. Its very existence

\* C/o. Station 8WA, Wagin, Western Australia.



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These two Units are brand new, and are packed together in their original packing cases.

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Transceiver ..... £15/0/0 } if supplied separately.  
Indicator Unit ..... £7/10/0 }

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Type 189, containing Klystron Tube, three Neon Stabilisers, one EF50, two half-wave Selenium Rectifiers, one 5U4 Rectifier, one CV85, Potentiometers gears, Resistors, high voltage Condensers and Transformer. Price £4/19/6.

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- 6—Single Pole Double Throw Switches.
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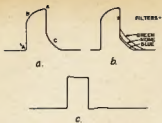


FIG. 5. EFFECT OF SCREEN PERSISTENCE

is doubtful, as the oscillograph used has a response falling from 100 Kc., and could account for it.

Curves B and C are due to screen persistence, the effect being an integration of the total light from spot and tail. The effect of blue and green filters is shown in Fig. 5b.

Video circuit correction for the tail, by "high peaking" will provide excellent compensation, as shown in Fig. 5c. Thus the use of a blue filter seems of little value, as it causes considerable light loss, and the improvement in the correction of persistence is small.

The effect of phosphor persistence on the reproduced picture is that a sharply defined white area is followed by an area of decreasing white "smear" and a black area by a black "smear." High peaking removes it completely.

## POWER SUPPLY

This is a separate unit, and is a normal supply giving 400 volts positive for the discharge tubes and amplifiers. An e.h.t. supply of 3 kv. negative is obtained from a radio frequency e.h.t. oscillator and 2X2 rectifier.

A commercial e.h.t. oscillator coil was used at first, but failures due to repeated arcoverers forced me to make a unit using a slotted former of loaded ebonite. Six slots,  $\frac{1}{4}$ " wide and  $3\frac{1}{16}$ " deep, spaced  $\frac{1}{8}$ " were cut in a  $1\frac{1}{2}$ " former. The end slots carry 60 turns of 30 gauge B. & S. enamel wire, for the tuned plate, and grid tickler windings. The centre four slots each have 200 turns of 34 gauge B. & S. enamel wire, this being the self-tuned e.h.t. winding. A 6V6 tube is used as oscillator, and the output voltage is readily controlled by varying the plate voltage of the tube. A filament transformer, 4 volts at 1 amp, insulated for 3,500 volts, was made for the c.r.t. filament.

Fig. 6 shows a circuit of the r.f. e.h.t. supply.

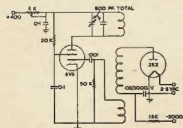


FIG. 6. F.S.S. E.H.T. SUPPLY

### PHOTOCELL AND PREAMPLIFIER

The 931A photocell used is a multiplier type, with a nine stage multiplier. Upon the incidence of light, electrons are emitted from the photocathode, and electrostatically focussed on to the first dynode. The dynodes are treated to emit copious secondary electrons. Provided that they emit more secondaries, than primary electrons received, amplification takes place.

By focussing secondary electrons progressively on to the next dynode, considerable amplification is possible (up to 200,000 times). The final anode will therefore collect many times the electrons emitted initially by the photocathode. The tube is not frequency sensitive, electron transit time being the only limitation, which is far above video frequencies.

Fig. 7 shows a schematic of the photo-cell and preamplifier.

For convenience in circuitry the final dynode is earthed, and 800 volts negative used to provide about 90 volts per dynode, for the multiplier. To avoid degeneration, this e.h.t. supply must be heavily bled to swamp the dynode currents. For this reason, the voltage divider consists of 20,000 ohms per stage, giving an e.h.t. bleed of 4.5 Ma.

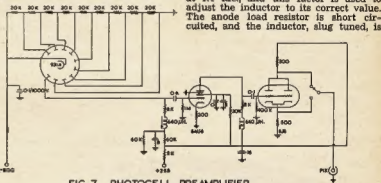


FIG. 7 PHOTOCELL PREAMPLIFIER

To maintain accurate dynode focus, the dynode to dynode potentials must be equal, so reasonably well matched (2%) resistors were used.

The anode of the 931A is fed from a regulated positive 255 volt supply, to apply 125 volts to this electrode, through a decoupling network.

In order that the frequency response of the system, before high peaking, should be substantially flat from 25 c.p.s. to 1 Mc., shunt peaked R.C. amplifiers were used throughout. The description of the method of shunt peaking which follows, refers to all the video amplifiers, except in the video mixer, where anode loads are so low that peaking is unnecessary.

### SHUNT PEAKING

In this, the anode load of a stage consists of a resistor and inductor in series. They are so proportioned, that together with the total shunt capacitance of the stage, a flat response is obtained to the frequency desired, and a higher stage gain can be obtained than in an uncompensated stage.

The shunt capacitance of the inter-stage coupling elements to earth, and total input and output capacitance of

the R.C. coupled tubes, is found as follows:—

1. The load resistor is replaced by an inductor of known value.

2. A signal is injected into the grid of the tube, which has the inductor as load, from an r.f. signal generator. With vacuum tube voltmeter the frequency at which this total capacitance resonates with the inductor is found. From this frequency, and the known inductance, the shunt capacitance can be calculated.

3. The measured capacitances were of the order of 24 pf. in each case, the value of the P.F. was around 8000 ohms. This reactance controls the value of the load resistor of the P.E. cell and the video amplifiers.

The load resistor in the anode of each stage, was made equal to the reactance of the shunt capacitance at 1 Mc. With this load, without compensation, the response would be down 30% (3 db) at 1 Mc. An inductor is now inserted in series with each anode load resistor, with a reactance at 1 Mc. of half the anode load resistance. The response will now be flat to 1 Mc., falling rapidly at higher frequencies.

Under these conditions the inductor will resonate with the shunt capacitance at 1.4 Mc., and this factor is used to adjust the inductor to its correct value. The anode load resistor is short circuited, and the inductor, slug tuned, is

resonated at this frequency. The short circuit of the anode resistor is now removed, and compensation has been effected. Each stage is adjusted individually.

At low frequencies (25 c.p.s.), the factors causing loss of gain are the reactances of the coupling capacitors, and of the cathode by-pass capacitors. Large coupling capacitors are used, with negligible loss, and the cathode by-pass was omitted, permitting degeneration, but not a serious loss of gain.

The 6AU6 presampler has a gain of about 35, which is sufficient to swamp noise, and provides a level to the cathode follower well above the hum level from the cathode of the cathode follower. With transparencies, an output of 1 volt peak/peak is easily obtained.

The cathode follower is a 6J6, with both triodes strapped in parallel, and with plate and cathode loads of 5000 ohms. The plate load resistor enables a signal of opposite phase to that at the cathode to be obtained, but at a higher impedance. This enables a positive picture to be obtained from either a positive or negative transparency, and assists in correction, where the polarity

(Continued on Page 10)

# BATTERY PORTABLE FOR 144 Mc.

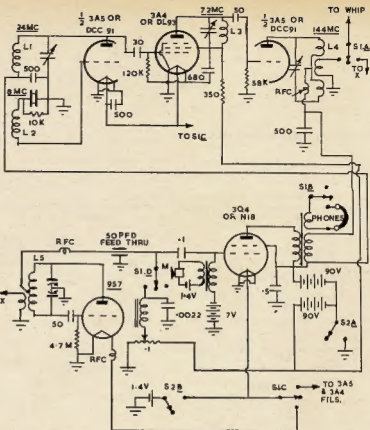
BY J. BAIL,\* VK3ABA

A 50 Mc. low power battery portable using a crystal controlled transmitter and super regenerative receiver was described in May, 1951, issue of "QST." The transmitter consisted of one 3A5 twin triode in the r.f. section and a 3Q4 for the modulator. With a standard 8.4 Mc. crystal one triode section of the 3A5 served as a regenerative crystal oscillator on 25 Mc. while the other triode section was a frequency doubler final on 50 Mc.

The possibility of obtaining output on 144 Mc. from one of these tubes suggested itself. The only changes necessary were to provide an appropriate standard crystal, fundamental frequency 5 Mc., and, secondly, replacing the 50 Mc. output circuit with one on 144 Mc., thus making the frequency multiplication in the second section of the tube, six times, i.e., from 24 Mc. to 144 Mc.

A unit was built up on rather similar lines to the 50 Mc. job mentioned. Since a combination output and modulation transformer (from a 108 disposals Army set) was available, only one tube, a 3Q4, was used in the audio section for both transmitting and receiving; with a 957 as a super regen detector. Using a 90 volt minimax B battery for the h.t. supply, the unit worked effectively considering that the r.f. output was, naturally enough, extremely low. In

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combination with a quarter wave whip antenna it was possible to work the home station from a good location two miles away. However, in order to improve results from the nearer shielded locations, it was decided to increase the output from the final.

An extra tube, a 3A4 pentode, was installed as a trebler following the crystal oscillator to drive the final as a doubler. This meant more current drain on the batteries, but, as space was available in the case, two 90 volt batteries were installed, one for the 3A5 and 3Q4, the other for the 3A4 and 957. The improved performance made this well worth while.

The case for the rig was made from a standard 10 $\frac{1}{2}$ " x 8" x 2 $\frac{1}{2}$ " aluminium chassis with the edges bent to form flanges for attachment of the back with self tapping screws. This leaves a space of two inches in the case.

The operating arrangement is to wear the unit to the side of the chest by means of a strap over one shoulder. A section of disposals military webbing was used for the strap. The whip antenna, 1' 7 $\frac{1}{2}$ " in length, plugs into a co-axial connector in the top of the case, and the controls are easily accessible with one hand while the other hand is available to hold the telephone handset.

The diagram shows the arrangement of the major parts. Some of them are mounted on a shelf which divides the case into two. The crystal socket is

arranged for external plugging in of the crystal and a four pin miniature socket is provided for the lead to the telephone handset.

The change-over switch, S1 (A, B, C, D), is a four pole, three position, midget single wafer rotary job and embodies the following functions:—

- Aerial changeover.
- Connects the A battery to either receiver or transmitter tubes (the h.t. batteries being permanently connected to the tubes except when S2 (A, B) is open).
- Closes the low impedance head-phone circuit in the receive position.
- Open circuits the 957 plate supply lead in the transmit position.

The double pole single throw switch S2 is turned off when the set is not in use otherwise the 3Q4 and potentiometer will draw current when S1 is in the central position.

### TRANSMITTER TUNING

The tuning condenser in the crystal oscillator circuit has a maximum capacity of about 40 pF., and in the trebler plate circuit a 3-12 pF. ceramic trimmer is used. The final output circuit is tuned with a 1.5-7 pF. ceramic trimmer. These three condensers are screwdriver ad-

Scale: Half Size.

justed from outside. Indication of grid current with a temporarily connected meter in the trebler stage, served for checking crystal oscillator tuning, and grid current appears when oscillation takes place.

It was necessary to make certain that the crystal was controlling the oscillation, some adjustment of the amount of feed back being necessary. A communications receiver with an S meter provided an additional means of checking output, the circuits having been previously lined up with the aid of a grid dip oscillator. In peaking the trebler stage, maximum grid current in the final was aimed for. The final was then peaked with the help of S meter indication in the receiver with two metre converter.

To economise in battery current, it is essential to keep transmissions brief. A "B" eliminator supply was found to be most useful when tuning up and testing.

In this connection, a practical suggestion has been made by the Technical Editor applying to bench testing of any portable or mobile gear which is normally operated directly or indirectly from batteries. This is to install a socket in a convenient location in the gear, connected in series with the internal supply leads. A shorted plug is provided, and

when testing at home this may be withdrawn and replaced by one with supply leads running to some a.c. derived power supply in the shack.

### COIL DATA

L1—14 turns, 9/16" diam.

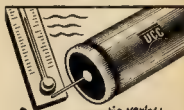
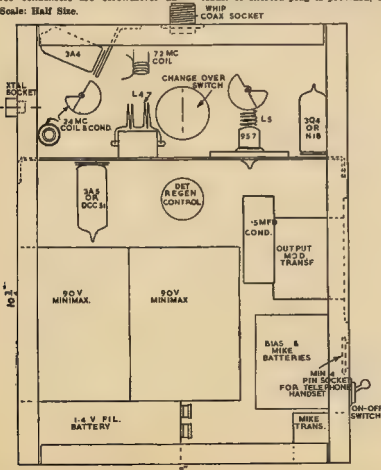
L2—8-10 turns, 3/8" diam., wound in opposite direction to L1, mounted inside L1, with crystal end coinciding with cold end of L1.

L3—4 turns, 3/4" diam.

L4—4 turns, 9/16" diam.

## A.O.C.P. CLASS

The Victorian Division A.O.C.P. Class will commence on Thursday, 30th July, 1953. Morse and Regulations are held on Monday and Theory on Thursday evenings from 8 to 10 p.m. Persons desirous of being enrolled should communicate with the Secretary W.I.A., Victorian Division, 191 Queen Street, Melbourne (Phone FJ 6997 from 10 a.m. to 4 p.m.), or the Class Manager on either of the above evenings.



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# AMATEUR CALL SIGNS

FOR THE MONTH OF JUNE, 1953

## ADDITIONS

**VK—**  
**2ED-K**—S. Mullan, C/o. Post Office, Raleigh, North Coast, N.S.W.  
**2XZ-N**—C. Seymour, "Pyendale," via Forbes.  
**2AOY-A**—Kitchen, 8 Eddy Road, Chateauwood.  
**2ASA-D**—L. Pearsall, 92 Railway St., Wyong.  
**2ATW-T**—E. Whitfield, 12 River Rd., Oatley.

## Queensland

**4GI-G**—N. Chapman, Royal Hotel, Mount Gar-  
**4NJ-N**—Jones, 31 Swan Terrace, Windsor, Bris-  
 bane.

## South Australia

**3DD-D**—N. Campbell, 8 Wotton St., Cheltenham.  
**3EF-E**—C. Dew, East Terrace, Gawler.  
**3FM-F**—J. B. Porter, 137 Anzac Highway, Grass-  
 mere.

## Western Australia

**6FM-F**—R. H. Mould, 33 Aurelian St., Palmyra.

## Territories

**RAD-E**—P. Black, Radio 9FA/VLT, Pt. Moresby.  
**9AH-A**—J. Humphries, Buin, Bougainville, T.N.G.  
**9GV-G**—V. Campbell, C/o. A.W.A. (Box 13),  
 Las, T.N.G.  
**9MG-O**—G. W. Mullins, C/o. M.V. "Wallach,"  
 Lighthouse Tender, Samarai, Papua.

## ALTERATIONS

**VK—**  
**2FV—**"Signalling School," No. 6 Jetty, Cir-  
 cular Quay, Sydney.  
**2XU—**45 Miller Street, Cammeray.  
**2AOW—**19 Trafalgar Street, Stanmore.  
**2AFW—**323 Cornish Street, Broken Hill.  
**2AIP—**25 Maher Street, Hurstville.  
**2ARK—**Footscray, Bourke.  
**2ARL—**Station 219 Pacific Highway, Hornsby;  
 Postal: 68 Eastwood Ave., Eastwood.  
**2AVM—**Flat 2, 9 Ripwood St., North Sydney.  
**2AVP—**Station. Alunale Hotel, Canberra City;  
 Postal: Reid House, Canberra City.  
**2AWH—**34 Robert Street, Belmont.

## Victoria

**3AO—**Flat 4, 385-A Victoria Pde., E. Melbourne.  
**3FV—**34 Leath Street, Canterbury.  
**3YV—**374 Balwyn Road, North Balwyn.  
**3NU—**318 Canterbury Road, Canterbury.  
**3FV—**29 Narong Road, Caulfield North.  
**3QV—**41 Berkeley Street, East Oakleigh.  
**3RU—**16 Koonung Street, Nunawading.  
**3WS—**12 Denbigh Street, Frankston.  
**3AHM—**York Way, Appenzelle.  
**3AIG—**Bambury Street, Boronia.  
**3AMZ—**34 Cummins Road, Moorabbin.  
**3ANU—**Postal Address: 315 Canterbury Road,  
 Canterbury.

**3APV—**Station: C/o. O.T.C. Receiving Station,  
 Rockbank; Postal: 29 Narong Rd., Caul-  
 field North.

## Queensland

**4RL—**Brenda Street, Morningside.  
**4WJ—**C/o. J. P. Baker, 30 Cromwell Street,  
 Woolloowin.

**4XD—**Station: 18 Garrick St., West End, Towns-  
 ville. Postal: C/o. Station 470, Towns-  
 ville.

## South Australia

**4CU 1**—The Grove, Dulwich.  
**4GF—**285 Angus Street, Adelaide.  
**5HE—**Postal C/o. Mrs. Goode, 26 Areland Ave.,  
 Trinity Gardens, Station: National Bank,  
 John St., Salisbury.  
**5LF—**10 River Avenue, Oaklands Estate.  
**5RF—**Alice Terrace, Murray Bridge.  
**5RF—**Name should read: P. R. Paraders.

## DELETIONS

**New South Wales:** VKs 2AK, 2ER, 2IN, 2XZ,  
 2ARL, 2AKY, 2AOV, 2ATF  
**Victoria:** VKs 3HV, 3KI, 3LC, 3MJ, 3ZW,  
 3AGF now operating under VK4GLJ.  
**Queensland:** VKs 4AD (now operating under  
 VK4AD), 4DE, 4FY, 4LJ.  
**South Australia:** VKs 5CV, 5EE (now op-  
 erating under VK2EB).  
**Tasmania:** VK7NM.  
**Territories:** VKs 9FM (now operating under  
 VK8FM), 1ELd, 1JW, 1LR.

# REMEMBRANCE DAY CONTEST

Amateurs in the VK1 call areas have expressed their keen desire to participate in the annual Remembrance Day Contest, not because they can expect to compete for the Trophy attached to the Contest, but because of the spirit on which it was founded—the remembrance of those of our ranks who passed between the vale in the service of their Country during two world wars, in particular World War II.

There is no reason why they should not have this privilege extended to them except that, administratively, it is difficult from the point of view of scoring.

Federal Council has agreed to their participation, and in doing so has decided to award six points per contact per band for VK1 contacts for all States. Until the result of their participation is analysed in the final scores, it is justifiably fair to award the same points in each State.

The Federal Council has authorised the Federal Executive to obtain the Log Sheets from the VK1 call areas and this will be done in time for the final result checking.

Rule 5 is amended to read: A station may be operated by more than one operator under the station call sign provided that operators, other than the station licensee, submit a separate log under his own call sign for contest purposes.

The Contest will commence at 1800 hours E.A.S.T. on 15th August and continue through until 1759 hours on the 16th August. Rules and scoring details will be found on page 10 of last month's issue.

## AMATEUR TELEVISION

(Continued from Page 7)

of a test pattern can be reversed at will. At the cathode, a positive signal for white is obtained.

## POWER SUPPLY

In order to avoid changes in gain of the 831A, with changes in mains voltage, and to avoid mains fluctuations effecting the video output of the low level stages, regulated h.t. of 255 volts is used throughout the preamplifier.

**800 Volt Supply.**—Another r.f. e.h.t. generator is used for this negative supply. A 8V6G oscillator tube, and a coil similar to that for the flying spot scanner gives this voltage at 4.5 Ma.

Due to the lower voltage and higher current, the transformer windings are different, in that the e.h.t. winding is in three slots, each of 100 turns, the other windings and spacings as for the other unit.

(To be continued)

## CHANGE OF ADDRESS

W.I.A. members are requested to promptly notify any change of address to their Divisional Secretary, not direct to "Amateur Radio."

## EDITORIAL

(Continued from Page 1)

bers of the Advisory Committee. They have no fear of having their names published because they are out to help the Amateur, not hinder and victimise him.

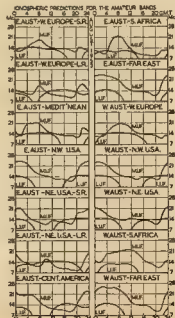
The Institute members of these Committees are nominated by each Division annually to protect the Institute members' rights as well as to assist the Department in keeping law and order on the Amateur bands. Don't forget that! In representing the Institute these members have a directive, a policy, something to work towards and which is laid down in the Institute records and the rules under which the Committees function.

The non-member representative has a more difficult task because he must represent Amateurs who are not organised to assist or direct him, but nevertheless he is a man chosen by the Department for his fair-mindedness and his impartiality in dispensing discipline whether to members of the Institute or otherwise.

You can talk to these men on the air and they will be pleased to co-operate with you in advising you where you or your transmission is at fault. If you receive a pro forma for some misdeemeanour, it shouldn't be because you have erred for the first time. You have a say in putting the Institute man there on the Committee to protect your own interests so you should be sure he has the qualities required of him—justice, impartiality, and a sense of fair play.

FEDERAL EXECUTIVE.

## PREDICTION CHART FOR AUG., 1953





## FIFTY MEGACYCLES AND ABOVE

## NEW SOUTH WALES V.N.F. GROUP

[illegible]

Alan EAST was the recipient of a very nice cup, won by him on a field day some months ago. Alan was on Mt. Tomar operating from a car during very wet weather and put up the top score. Congratulations Alan. We are sorry to hear of the departure of ZABW from VK3; he will be a loss to us on 2 m. Berry is off to VK3 land, we wish him "Au Revoir" and best of good luck. We welcome 2A... of Manly to the v.h.f.s. he was heard in contact with ZABW, keep a look out for him on 146 Mc.

21G has a lift in power these days and puts out a healthy signal on 144. 21H is v.f.o. controlled. WJ 2SA has been getting out well and has heard 2BZ of Newcastle at 80 to 90 and hopes to contact him. Bill 2ABZ has acquired a new rx, a BC348, also has a new xtal cascade and a new 600 ohm old 5U1 and hunting for 27H is coming back soon to 144, he has not been too well. 2WJ has been off for a while, what's wrong John? 2HO has now acquired a pair of 8012s for \$76 Mc. and hopes to be on soon. 2ANF has been busy. Looks as though 21G and 21H are the only ones who are strong. The weak from South and West. The Northern boys have been heard at 80 to 7. 2UJ coming in when they are on.

Keep a look out for 3ADB at Wahroonga,  
Sydney, about 300 cycles above whatever fre-  
quency you call him on. He has only a walkie  
talkie, but he is high up. Alf 3CE has his  
mobile gear permanently installed in his car  
and has just finished a xtal converter for 144,  
and is now on the home tx. 1ATO is heard a  
lot but he seldom calls CQ. wonder why?  
He has an excellent signal. 3ATQ has been  
seen doing a bit on 144. 3ATP threatens to  
come back on 144 one day.

2FO having a spot of bother with his 144 rig. Tom has a strong signal, his frequencies are 144.13 and 144.8. Carriers have been heard from Dubbo direction, but they were on phone and too weak to identify ZHE has a good signal and location.

The W.I.A. Award for 100 contacts on 144 Mc. is now an accomplished fact. So go to it boys and gain this Award. 100 cards must be held to gain this Award. The QSL card situation is grim on 144 Mc. Some chaps report that they have no chance of winning the Award because they cannot get verification. Now chaps how about a little co-operation?

Harry 2AJZ has been putting out a nice solid signal of late. 2ARG came up the other night on 144! Maurie 2VN also came up again with a better signal, stability and quality both good for mod. csc. Tom 2IY and Steve 2YR have been on 144 again, glad to hear them on again.

On Sunday, 26th June, a very successful and pleasant field day was held by the V.H.F. Group of the W.I.A. The fox was a mobile unit operated by John ZANF assisted by the mobile unit of the W.I.A. The fox was used for strategic manoeuvres, went into hiding some 25 to 30 miles from Sydney. The first official call was given at 10 a.m. when the fox announced that he was now ready for action. At 11.00 a.m. the fox was mobile units, started to find the fox, backed by at least six or seven home stations. Bearings were taken and given, and the fox was located. The hounds, and as many as 100 foxes, were taken. The fox was taken. All seemed to have a very happy day.

The bounds were 2ABZ and 2HO, 2AJZ and 2QZ, 2HL and Cess Cronan, 2OA and 2LG, 2AJR and 2HI plus Niel Tenfold, 2AOA 1L, lone bound, 2KS and 2AGT, 2CL and 2YL. Bob and Harry also had their XYLA in addition. There were a number of walking trails around the 2000 acre property and the foxes were around, the rx's being as good as the tx's! The first bound to arrive was Keith 2AOA, who found the fox at 11:45 a.m. Next in was Leo 2KS at 12:30 p.m. The rest came in in a quick resp, except for 2AGT, who was picked up by Cess Cronan on his walk. Cess directed Alf in; SCE was

only half a mile away. We were very pleased to see so many turn up, making it another victory in field days. When is the next?

Our congratulations go to JAGA. It was a good effort. Keith started off early in the a.m. and went to Penrith and from there he hounded the fox who finally was about two miles from Narellian near Cobolty. Congratulations also to the fox, the hide-out was very good.—ZHO.

## VICTORIAN V.R.F. GROUP

Another interesting lecture was given at the June V.H.f. Meeting by Kevin JAMB, the subject: "Hearing Aid Techniques." He had at his disposal a wide range of hearing aids, a selection of the modern hearing aid. The problems encountered with these devices are common to all hearing aids, and he stressed the importance of emphasis on maintenance, reliability, and economy of battery power. Kevin commenced the lecture with a demonstration of the various types of hearing, together with the types and variations of deafness encountered in individuals. Thereafter, he discussed the various types of hearing, receptive or inner ear deafness, and some show a hearing loss in only one portion of the audible spectrum. He then discussed the various types and variety of requirements of instruments developed to help those so afflicted, and some care and maintenance of these instruments. Tests with people who contemplate using them.

Some idea of normal hearing is shown by the fact that the normal spoken voice should be audible to a person 40 feet away. With this as a reference level, the degree of hearing loss of a person for a given frequency may be fairly accurately determined in decibels.

The main variables that a designer of these aids has to deal with are: (1) Maximum output; (2) Mean amplification; (3) Shape of response curve; (4) Automatic compression; (5) Conversion efficiency, the ratio of acoustic output to battery power consumed. The modern aid consists of a two or three valve audio amplifier, in some cases with a.v.c., and employing subminiature tubes and other small components including crystal microphone and batteries in a typical size of  $3\frac{1}{2} \times 2\frac{1}{2} \times \frac{3}{4}$  inch and representing

sents the application of many developments in electronics and acoustics. The large number of questions asked showed the interest displayed in the lecture and Kevin was warmly thanked.

V.H.F. Meetings are held on the third Wednesday of each month in the Institute rooms, 191 Queen Street, 6th Floor, at 8 p.m., the next one being on 14th August, at 8 p.m. Quentin SIM will give a lecture on "A demonstration of the Geiger Counter." All are welcome to attend this meeting, so bring along a friend.

On the evening of 18th June, 3LN made a 2 mx mobile excursion to the eastern suburbs. His progress was followed with great interest by those on the band, including 3ADU, 3ED, 3AIK, 3ABA, 3YR, as he negotiated the various hills and depressions on the route followed. The rx speaker served as a microphone while transmitting. Len was running 3w. to the final, line-up: 12AT7 c.o. and 6BL6, 12AT7 tribr., 12AT7 final. The rx is a converter into a super reg. second detector and the antenna two dipoles at right angles as a single bay turnstile.

The 238 Mc. gang have been very quiet this month. 3A5J loaded the gear into the car, but struck rx trouble after leaving home, hence no contacts. 3A8Hs building a converter, using 955s. 3ATK should be on within the next few days. No news from 3AAP or 3ED. 3QO can still be heard on odd occasions. 3A9J appears to have deserted the band to concentrate on a tape recorder. 3A9J planning new rx and tx, tentative idea being 5 tube super and m.o.p.s. using 7163s driving an 8K34, should be ready before summer.

With the assistance of his friends in the N.E. Zone, 81d 3CI expects to have a 6 mx 3 over 3 beam 40 ft. high, should get out well. 81d also comes on 3 mx each Sunday at 7.30 p.m. beaming south from Nagambie. A 2 mx hook-up in the N.E. Zone is held each Friday night at 7 p.m. and afterwards about 7.15 they stand by for calls from Melbourne and elsewhere.

As has been announced on several occasions an Award is available to those in VK3 who make 100 or more contacts above 100 Mc. The rules are as follows: (1) Awarded to those VK3 Amateur licensees who submit evidence of having contacted two way, at least 100 other stations on amateur bands above 100 Mc. during the year list are 1944. (2) Confirmations to show the usual QSL information including call sign and location, date contact was made, band used and report. (3) All authorized bands above 100 Mc. and any authorized type of emission may

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[illegible]

be used, provided always that the Amateur Regulations are observed. (4) The claimant licensee may have operated anywhere within Victoria and either he or the station worked may have operated mobile, portable or fixed or may have changed address. (5) Only one contact per licensee may be claimed regardless of band used or method or location. (6) Claims to be submitted in writing to Secretary, Vic. Div., together with a legibly written list of the confirmations submitted. The confirmations should be forwarded by registered mail and return registered postage should accompany the application. (7) An attractive certificate to be awarded to each successful applicant. (8) The V.h.f. Group reserves the right to modify the rules if necessary (subject to sanction of Vic. Div. Council). (9) In case of any dispute concerning a claim, the scrutineer (at present the Chairman and Sec. of V.h.f. Group) decision to be accepted as final.

Overseas Amateur magazines report a period of excellent conditions on 144 and 430 Mc. in the United Kingdom and Northern Europe during the beginning of March, many contacts being possible over relatively long distances with unusually high signal levels. A contact over a distance of 647 miles was made on 144 Mc. between OC2EIK on Guernsey, Isl. and OZ2FR in Denmark. On 430 Mc. GW2ADZ worked ON4UV, 350 miles. GW2ADZ also had a cross-band contact with DL2FPM, in this case he was transmitting on 144 Mc. and receiving DL2FPM's 430 Mc. signal.—AABA.

#### SOUTH AUSTRALIA

"DX without ditches," is the v.h.f. motto but I believe that the Pt. Lincoln Hams are soon to change it with signals across the Gulls, so come on 144, probe 8VJ and 3LT with one of your three-phase pitch forks: the boys here are waiting for you. Col 3CJ says that after calling in vain for nearly four weeks, he was surprised (other Monday night at 1900 hours) by 8CH, 3MS and 3TW who had suddenly come to life. John 8VJ is expected to join the "Limestone Leechers" at any time now—in fact before these notes reach the printers! Claude 8CH is operating from the new QTH, using, I presume, some of his own distillate!

From this source and from Ray 3BT I have information that there is a very good brand of I.F.F. English 2C series filtering into VK5 land from disposal sources at the moderate outlay of five oddies. The g.g. is to rip out the r.f. end,

use a diode mixer with the 965 as the v.f.a. and leave the I.F. channel on 23 Mc. alone. They are best used on 288 or 576 Mc. Coverage at present is 120-180 Mc.

Bob 3FU is also converting an AS14 into a double conversion rx. This has an i.f. of 55 Mc. with 6AC7s in the line-up. Second converter to be a 6AG7 giving 2nd i.f. of 14 Mc. The front end will use 650 osc. feeding a push-push 6J6 mixer. Ray 3BT has ideas of using the 2C I.F.F. unit—leaving the i.f. stages alone (using V1850) and re-wiring the front end for two channels—288 and 576 Mc. An EA50 diode for detector in a co-axial tuning with 7183 as the 288 Mc. osc. and RL18 osc. on 576 Mc. Co-axial mixing valves give much lower noise figure with diodes—silicon diodes give good results but have limited current values and can easily be burnt out. The EA50 v.h.f. diode can take the rip much better. Think of the idea of adding a .1m. discriminator to these hand jobs and enjoy good reception from the mod. osc. I am very grateful to you Ray for your interest in these notes.

Harry 3EN has returned to the fold after two years' absence, using a "drain pipe" co-axial alop of the fire station tower. Lionel 3LB is now very active using a super regen and mod. osc. Dougal 3BV blitting on 6 mx and asking me for his 2 mx converter. SLC always good for 8 mx. Pete 3FM has a new ideal location on the 500 ft. hill at Milchem and should be good for some QSOs soon. Ted 3MO back with us and with every opportunity for carrying on v.h.f. and even u.h.f. work should be able to give a lead with his technical ability.

Keith 3MT says his frequency is 288.007 Mc. Clem, so you two can fight that one out! Col 3RO is on 288.33 and in his rx he uses a 7190 Mc. xtal, multiplies 40 times to 288, and feeds out on 4 Mc. 5JW heard calling 50C on 1 mx and listening on 39 mc—some real cross-band working. 3KA, 3JH, 3KY all active on local skeds. 3DH spending time on portable around the hills with Athol 3LQ also active on 288 Mc. From Tom 3TL news not so good. The Murray Valley gang is having mechanical troubles. Harry 3KW did in a pair of 7183s when the crystal holder fell out of the socket, then the xtal followed and finally his 329 didn't bounce off the floor! The 8 Mc. xtal was Tom's—apply to 3BY, he has a rubberer one that bounces all over the band! The 66s should make a very good grid-dip osc. Tom. Send it down for calibration.

Incidentally it can pay off on these v.h.f.s to have a separate antenna system for tx and rx. It is very difficult to make a feeder work well both ways and generally we make compromises. In reception, an impedance mis-match between the antenna and the line is not nearly as serious as a mis-match between the line and the rx input. High a.v.r. occurs on the line, resulting in greater losses in the dielectric and by radiation from the feeder. A mis-match between antenna and line, on the other hand, affects only the efficiency of power transfer. In the case of transmission systems, the situation is reversed. If difficulty is experienced with matching into the rx, place a piece of metal foil around the 300 ohm ribbon and slide it back along the line away from the rx until signals improve.—3XU

288 Mc. is still the most popular band in this State. Five years ago this band was almost deserted except for one or two stalwarts. About three years ago new stations began to appear nightly and the stage has now been reached when one can turn on the rx any night of the week and hear many stations in QSO. On week-end distances in the order of 30 to 50 miles are covered by chaps operating portable and QSOing Adelaide stations. (Nobody as yet has broken the existing Australian record of 106 miles!)

Since last April 3RO and 3MT have been experimenting with xtal controlled txs and rx's, and from the 24th May have been operating consistently on 288.33 and 208.00 respectively using xtal controlled txs and xtal controlled converters at both ends. 3RO's tx is a 3CG35A (rx section of SCR322) driving a separate 832 final amp. Last 832 in 3CG35A tripling from 98 Mc. to 288 Mc. with half wave lines in plate circuit. 100 watts input to final amp. Rx 7.1 Mc. xtal multiplied 40 times, 6J6 push-push mixer with half wave grid lines. I.F. tuning range is 4-8 Mc. 3MT's tx: 3CG35A driving a QQCQ/15 final amp., last 832 tripling as above to 288 Mc., driving the QQ amp., which has half wave grid and plate lines; grid drive to QQ amp. with 250 volts on 3CG35A driver is 1.9 Ma. 275v. on driver gives 20 Ma. Ig to QQ; plate input to QQCQ/15 final amp. is 15 watts Rx 7.650 Mc. xtal multiplied 56 times, 6J6 push-push mixer with half wave grid lines. I.F. range 4-8 Mc. 3KC has completed his xtal converter (similar to 3RO's) and has started constructing a xtal tx for the band using a QQCQ/15 in the final.



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894-23	500	2, 3.7, 8, 12.5	2	50-10,000	5	Line to Voice Coil	28/3
900-22	2,500, 5,000	2, 3.7, 8, 12.5, 15	1	*40-15,000	15	Single 807, EL34, etc., to V.C.	57/6
898-9	8,000, 10,000	2, 3.7, 8, 12.5, 15	1	30-15,000	15	P.P. 6V6Gs, A or AB1 to V.C.	62/6
897-9	8,000, 10,000	100, 125, 168, 250, 500	1	30-15,000	15	P.P. 6V6Gs, A or AB1 to Line	62/6
783-9	3,000, 5,000	2, 3.7, 8, 12.5, 15	1	40-20,000	15	P.P. 2A3s, A or AB1 to V.C.	62/6
809-26	500	2, 3.7, 8, 12.5, 15	1	50-20,000	15	Line to Voice Coil	42/6
870-26	10,000	2 or 8	1	*20-20,000	**8	P.P. 6V6Gs or 807s as Triodes	57/6
871-9	10,000	2 or 8	1	*20-20,000	12	P.P. 6V6Gs or 807s as Triodes	81/-
872-9	10,000	3.7 or 15	1	*20-20,000	12	P.P. 6V6Gs or 807s as Triodes	81/-
891-22	5,800	85, 100, 125, 168, 250, 500	1	50-12,000	35	P.P. 807s, AB1 to Line	82/6
892-22	3,200	80, 62, 83, 125, 250, 500	1	50-12,000	35	P.P. 807s, AB2 to Line	97/-

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# FEDERAL, QSL, and DIVISIONAL NOTES

## FEDERAL

### W.I.A. MEMBERS ON AMATEUR ADVISORY COMMITTEES

The following members of the W.I.A. are representatives on the Amateur Advisory Committee in each State of the Commonwealth. Other members are Officers of the Wireless Branch of the Postmaster-General's Department in each State of the Commonwealth, and an Amateur chosen by the Department to represent the non-Wireless Institute Amateurs, in addition the Department appoints a number of Observers. The Editors in this issue of "Amateur Radio" gives details of the Committee's organisation and functions.

New South Wales	
Mr D. Duff	VKKEO
Mr J. A. Lindsay	VKBAKR
Mr J. C. Finlay	VKZKZ
Mr H. J. Powell	VK3AYP
Mr L. H. Taylor	VK1CL
Mr V. H. Wilson	VK3VW

Victoria	
Mr R. A. C. Anderson	VK3WV
Mr M. J. B. Bradburn	VK3SD
Mr C. R. Gibson	VK3FO
Mr G. W. Manning	VK3KJ

Queensland	
Mr J. C. Files	VK4F7
Mr G. Harmer	VK4CW
Mr M. T. Hewitt	VK4PD
Mr L. E. H. Mallinson	VK4LM
Mr J. F. Pickles	VK4FP

South Australia	
Mr H. L. Austin	VK3AW
Mr E. L. Davies	VK3GJ
Mr E. McAllister	VK3NO
Mr W. W. Parsons	VK3PS
Mr G. E. Wierneke	VK3GN
Mr A. L. R. Whittall	VK3WF

Western Australia	
Mr R. R. Campbell	VK6KU
Mr W. E. Cowan	VK6AG
Mr C. Hitchens	VK6HC
Mr H. T. Mulder	VK6MK
Mr W. Schofield	VK6WS
Mr W. S. Watson	VK6WW

Tasmania	
Mr T. A. Allen	VK7AL
Mr R. T. Calvert	VK7RT
Mr R. Dore	VK7TD
Mr L. W. Edwards	VK7LW
Mr L. B. Jensen	VK7LJ
Mr R. D. O'May	VK7OM

Tenure of office as a member of an Amateur Advisory Committee is normally for twelve months, a new body of members being formed in January of each year.

### AMENDMENT OF REGULATION 110 IN THE HANDBOOK

After discussions with the Postmaster-General's Department, Wireless Branch, Central Office, an agreement has been reached to amend Regulation 110 of the Handbook for the Guidance of Transmitters of Wireless Stations to include the 50 Mc band.

The Regulation as it stands, reads as follows.

"Except for brief tests, or adjustments or in the authorised frequency bands from 144 Mc upwards, no amateur station is permitted to transmit any signal, or to be used to transmit any signal, except a carrier wave to be emitted from his transmitting equipment unless such wave is subject to intelligible modulation. The frequency of the carrier wave of the authorised amateur frequency bands below 144 Mc must be made on an artificial scale."

This Regulation in effect means that an Amateur Station on 144 Mc and above can work under the amateur station licence given to Regulation 136 in respect to giving the call sign of the station working and the station being worked. With the addition of 220 Mc. to Regulation 110 interesting cross-band contacts can now be made to assist the v.h.f. experiments.

### TECHNICIAN LICENCES

Work has progressed on the introduction of Technician Licences and further detailed information will be advised shortly. Ready, the first of the new licence holders will sit in for the same examination as the A.O.C.P. candidate except that he will not have to sit for Morse code. Hence, an A.O.C.P. candidate

who fails in his Morse code can apply for the issuance of a Technician Licence, thus giving him the opportunity to conduct some experimental transmissions although he is not yet qualified and power until such time as he can pass the Morse code test for his A.O.C.P. How long he will be given is yet to be decided.

## FEDERAL QSL BUREAU

RAY JONES, VK2RI, MANAGER

The Radio Club of Cuba advise that the address of the QSL Bureau remains as Leifield No. 860, Habana, Cuba.

A list of the licensed stations in the Netherlands Antilles, P.O. Zone 9, has come to hand. The list shows 15 stations on Aruba Island and eight on Curacao Island. The QSL Bureau address is P.O. Box 1, S. J. Herrings, P.O. Box 80, St. Nicolas, Aruba, Netherlands Antilles.

Felix VK6AC, has finally arrived back in Noumea after his extended furlough in France. As he cannot regain possession of his old home until end of July, it is impossible for him to return to the air until September. While passing through Vila, Felix met FOAB and FUAC, and acquired a lot of H.P. advice. Felix was burned out power supply, output transformers and resistors while in Vila. When serviced it will replace his BC448 with which he was not entirely satisfied. On arrival at Noumea he noticed many new buildings and was delighted to observe his antennae still standing. One of his first jobs will be the construction of a new broadcast station for Noumea. While at Tahiti he met FOAB and FOAC, the latter being temporarily inactive due to change of QTH. He did, however, manage to extract from Georges a long overdue QSL for me and also one for VK3Z.

VK6M and VK1RR are both still awaiting cards from the printers and will get busy on distributing them as soon as they come to hand.

It is good to hear Jim Widdup, VK6WL, active again from Coober Pedy. As Jim says, an absence of about 18 months. Jim, one of the real old school of landline operators, was stationed at Darwin when that place was an important cable repeating centre some 40 years ago. Jim has a new rig running 100 watts powered by a Jap generator diesel driven, and plans to keep it at least each year for a year or so. He does not know when he will get South again and expects to leave his bones in the Territory.

The R.E.F. again point out that contacts with Chandernagor FNABD after 30th April, 1950, are not acceptable for Award consideration. It is not a longer French territory. They also state that FNEMS was unlicensed and of course unacceptable as is also FKBNQ for the same reason. VTA contacts prior to September, 1949, are also out as stations there to that date were unlicensed.

George Meston, VK6GL, of Norfolk Island, gives interesting details of his gear which is made up from bits and pieces salvaged from an A.W.A. Teleradio salvaged from the installation of the wrecked yacht, "Range", which met its fate while en route to Sydney to race in the Sydney-Hobart yacht race a year or so back. He has the advantage of two 60 foot masts and centre feeds the antenna with co-ax.

## NEW SOUTH WALES

A Committee has been appointed by Council to attend to publicity matters of this Division. Included in their duties is the collection of Zone 1 and 2 call signs and other notes to bring to the attention of members matters of importance or general interest. These Divisional Notes, we feel, are a valuable contribution to maintaining the interest in Amateur Radio. It is essential that notes be received not later than the 3rd of each month.

Publicity Committee, Box 1784, Sydney.

The first general meeting to be held by the Incoming Council was held on 26th June, with the presence of J. C. Jones, VK3Z, as guest. Notwithstanding a cold, wet and miserable night, a good roll up of members enjoyed a pleasant evening. Mr. J. Reed, VK3J, delivered the most interesting lecture on 220 Mc. versus 144 Mc. for Field Days. This lecture, illustrated with slides, was delivered in a typical R.R.

The Remembrance Day Contest, which commences at 1800 on 15th August, is worthy of the support of all Amateurs, and we suggest

that all members, wherever possible, take part and submit their logs to Box 1734. This is a good Contest—be in it.

Come along to the next meeting of the Division on 28th August at 8.00 p.m. on 28th August.

The Divisional Council has lost the services of two of its members, 2ZEO and 3XU. The loss of these two very hardworking members has been a bitter blow to the committee members that rightly have first call on their time. Their resignations give opportunities to Division 1 with time to, in their turn, serve the Division. This is a pity, as they are standing down. We hope, temporarily. The Division thanks them both for all they have done, and wishes them every success. They will be back on some future Councils of VK2, Bill Lewis, 2YB (ex-6VB), who in radio goes back to the 20's, and a member of the Institute of long standing, takes one of the vacant positions. The other has yet to be filled.

VK1 ZLO, RMI, 2AWN, 2ASW, 2XU, 2YB, 2YV, 2ZEO and 3XU have made it possible to get out the Monthly Bulletin. This made it easy work and enabled a good deal of the Institute affairs to be discussed. This is to be a constant reminder to every member to come along to "help and talk." See you in August—ring MU 1095 for the correct Thursday.

### HUNTER BRANCH

The June meeting of the Hunter Branch was held on Friday night, 14th/53, at Tighes Hill Techn. Club, Newcastle. With 12 members, John Clarke, 2DZ, in the chair. The lecturer for the evening was Ken Greenhough, VKG, lecturing on A.C. Amplifiers. The lecture was well received and was proved by the questions asked and questions asked.

The v.h.f. bands have become increasingly popular over the last month. Some of the Ron 2ASJ obtaining tx and rx for 144 Mc. Ron is using SCRS2 as his tx. Last 2XV has been using an SCRS2 on 144 Mc. This rx on 144 Mc. and puts out an f.b. signal. Leo 2QH has 144 Mc. gear, his tx is a mod. osc. Leo 2QH is using a 2000 Hz. oscillator should be on 144 Mc. shortly. Max 3OT reports he is ready for 144 Mc. transmissions. Bill 2PI has 144 Mc. and has converted disposal rx 2C181 to 144 Mc. reception. Bill 2XU has 144 Mc. on 144 Mc. but has SCRS2 tx and rx which he hopes to put on the band when time permits. Victor 2VW is using a 2000 Hz. oscillator active on 144 Mc. Bill 2AXM selling up his gear prior to shifting QTH to VK4 later in the year. Leo 2QH is presently driving the time the ship on which he radio operator was in part. Norm 2ANB pops up occasionally on 144 Mc. he's hear you on more often. Norm 2IAOR may be heard on 144 Mc. during month to visit Noel 4PQ in Bell. He also met Eric 4XN in Dalby, Cedric was and Allen 2ASO in Toowoomba and "Fedro" 4PR in Brisbane.

Don't forget the August meeting to be held at the NSW Technical College on Friday, 16th August.

### Hunter Branch Winter Social

One of the main events of the month was the Social held by the Hunter Branch. A good number of members and their guests made the Divisional President and his wife, Mr. and Mrs. Jim Corbin. Dancing and games were the order of the evening. The social was a success when it was announced that the Hunter Branch Ball would present "In a Persian Market." When Eric 2ZF as the Sultan, Harold 2AKA and George 2AGD as Sentinels, and Fred 2STubs as the Sultan's aide de camp, all suitably arrayed, entered, the audience knew they were in for a night of the strains of new music, the Ballet "girls" danced in and performed a "graceful" dance which really brought the house down. The girls wore frilly white skirts, white petticoats and frilly white unders, plus paper brasieres and hats, and decked out in beads, rings, eye-gaws and what have you. The "girls" had to be seen to be believed. Fears were held that Ron 2ASJ would laugh himself into hysterics, but an happy to report that such was not the case.

The Ballet "girls" were Johnny 2DZ, Varley 25F, Ron Dawson, Max 2OT, Jim 2ZC and Leo 2AOR. As it was "Theobald" Clarke 2DZ's birthday, a number of presents were made by the Sultan. Later in the evening Johnny 2DZ was presented with a large cardboard box with the best wishes of the Hunter Branch, and upon opening the box the bottom fell out, revealing a live rooster. So Johnny can now say that he has been given the "bird" in no uncertain manner. The social was a successful conclusion. Thanks are due to Mrs. Clarke and all ladies

who assisted in the making of the dresses for the Ballet and to all persons who assisted in making this Social a great success.

The aim of the Social was to bring members of the Hunter Branch and their XYLs together and so strengthen still more the community spirit and team work of the Hunter Branch. This Social certainly went far in achieving this aim.

There is no doubt that Mrs. ZYC must be interested in the W.I.A. as the following week we find the President 350 miles from home attending the South-Western Get-Together at Coolamon. The boys gave Jim a good hour's 'ear-bashing' on the Saturday night, just so they would have 'some of an idea' of what goes in the W.I.A. to put some really good queries on the Sunday afternoon. Mostly they wanted to know how he gets away so often. They don't seem to believe he just says, "must go to Coolamon on Sunday for the W.I.A." and the rest is easy—"sometimes." The whole week-end was a credit to all members of the South-West Zone as almost without exception those who did not attend, sent an apology. In some cases, just a long letter with excuses was received. The Dubbo gang wanted ZYC to come up to Dubbo the following week-end, but even ZYC wasn't game to try that one, so soon, on the 17th.

#### SOUTH WESTERN ZONE

There was great activity in Coolamon on the 4th and 5th July when a Zone Gathering was held with a view to holding a Convention in

the South Western Zone later in the year. There was a really good attendance of Exams and Associate members, including Stewart ZPL, Griffith; Don ZRS, Bert 2AEM, Art 2EU, Albany, Geoff ZBQ, Ross ZFN, Tunst; Al 2BW, Stan 2AID, Wagga, Jim 2AJO and Lyn ZAQE, Coolamon, and last but not least, our worthy President and Federal Councillor, Jim Corbin, ZYC. Also present were Mrs. 2AEM and Mrs. 2EU and a very active gang of Associates, Ron Braby, Brian Jones, Bruce Flock, Ted Drulitt, George Herriman (all of Griffith) and Bill Jenner, of Wagga.

Apologies were received from J.K. ZHP, JAWK, ZYV, BOD, 2AAG, IMF, 2OW, 2APP, 2DZ, 2R1, 2WH and 2ANV together with the R.I. Mr. Butler and Mr. Jack McPhee, all of whom intimated their intention to attend when the meeting was first taking shape.

After much discussion among the assembled gang, it was enthusiastically agreed by all that a Zone Convention of two days' duration be held at Wagga later in the year. An organising committee consisting of 2BW, 2AID, 2FN, 2PL, 2RS and 2AJO, with power to add to its members, is to arrange the details and decide on the exact date.

At the conclusion of the meeting, Ross ZFN tendered on behalf of the assembled gathering a vote of thanks to the President, Jim ZYC, for making the long trip to Coolamon and for his explanations to the questions asked by the assembled meeting.

Congratulations to Lyn ZAQE, now active on 80, 40 and 3 mX. Lyn ZBQ and ZPN are very

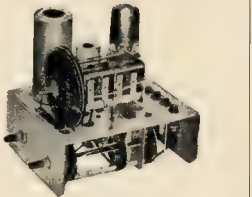
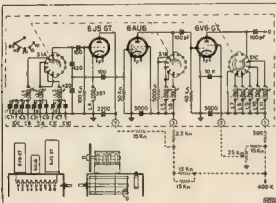
active on 344. ZRS also has a very nice set-up on 344 with EZ p.s. Don's rig was examined and much admired by all the Coolamon gathering. I can see the Associates really getting into the c.w. and theory now, so that they can get on the air. Build rigs like Don's and QSO all the Hams they meet at Coolamon.

#### COALFIELDS AND LAKES ZONE

News of the month! 2FZ has made it at last. Chris has fired up on 80 mX and has been renewing acquaintances. The rig is a revamped ATS, the antenna system defies description, but appears to be getting out. It would appear that ZYL's gear still works as Harry has been heard tickling the old bug again. 2ADT is still trying to find a band where there are any signals to work. (Please don't mention 2S) The experts still claim we have not reached the bottom. With the winter lull in v.h.f. activity, 2ABU has not been heard as much as usual, but bobs up for the occasional QSO on 8 or 2 mX.

2VU keeps close to the fire these nights but claims to be doing some re-building while keeping warm. 2RU had the misfortune to have his beam come adrift from its driving mechanism and now has it fixed. North Rumour has it that Major is busy on a "secret weapon" so results will be awaited. 2AEZ is a constant occupant of the 80 mX band, but was reported to be in conference with 2AMU over gear for 3 mX. The glow on the southern horizon which appeared recently was due, I am told, to fireworks in 2KR's shack. Trust you have things straightened out again, Cex.

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## VICTORIA

The July meeting took the form of a Tender Night, again under the guidance of 3LN. Not much music this time, but enough to keep Len and his assistants busy. The evening was not as good as usual, only about 60 being present.

Jack Vertigan spoke on the insurance policy advertised in "A.R." pointing out the advantages of taking out this policy. For the sake of most of the members, the insurance was not having. It covers almost everything except fair wear and tear.

The number of unclaimed QSL Cards is causing concern and it would be very much appreciated if those who have not claimed Cards recently would either call at the rooms or write to the manager, before the November 1st. Some of the Cards have been on hand since 1945. There is also a number of Cards for non-members including 30X, 32X, 34T and 34RO. If you know any of these cards, please pass the info along to them. The only new member for the month is Associate Arthur R. Cronch of Dunolly. Welcome Arthur, and don't forget the usual advice. The next State Convention is to be held at Benalla on the 25th and 26th of November. If you intend going along, please advise the zone secretary, so that accommodation can be arranged. As a reminder to the members, on any occasion, if you are able to help in this regard, please forward your suggestions to either Col or the Zone Secretary.

As for what everybody is doing, I would not know, but judging from the absence of signals from all bands, everybody must be listening to cricket or television for the week and catching up on lost sleep the next.

Notice the R.D. Contest clashes with a Test Match, so please change to a convenient time or to exchange a few serial numbers.

I was going to leave our portly friend in VK4 zone this month, but Peter, who is the printing paper several nights back caught my eye. E. W. Tipping agrees with me that Adelaide is the best of the DX'ers, and goes on to say there is a pub on nearby streets. It is apparently overlooking those in between. To the best of my knowledge, Mr. Tipping does not call signs and does not use a lot of notes, but even so, Sir, I raise my hat to you. To the portly gent, I say, "Why does a man write a good note?"

Old man weather turned on a good day for the TX Hunt on 15th July. The tx was excellently placed, some bushes on a reserve off Dandenong Road, NOB. The first was 3NZ, R. Bowen was second, and 3VZ third. Note that the following contest will be held at the Flaxton Gardens at the corner of William and Franklin Streets at 1.45 p.m. The signal will come in on 30X, 32X, 34T, 34RO. It is hoped that by starting half an hour later it will enable more to participate in the Hunt.

## EASTERN ZONE

Things are still very quiet under the zone. Ron 3AP is back on air with an 3B signal once again. You know of course that Ron has been re-building the rig in the new house. Arthur 3ABP has changed his place of employment and now works for the Government. The new air. Arthur's influence seems to be stirring the other boys down there into activity as Graham 3AO and 3AO are now active. The zone is about 2 m. Keith 3SX and Leo 3SG are very keen about 2 m., so that looks like being a very interesting battle in the zone. It should be very suitable for mobile operation. It is hoped that it will come into its own should it ever be necessary to carry out emergency operations again.

The old boy of the zone, the Zone Branch was held at the home of Oase 3AHR and a most enjoyable time was had by all. Preliminary plans were made for the Zone Convention which is to be held at Ororo in November, after which Cliff Manning, 3CJ, who is one of the local inspectors, gave a most interesting, informative and entertaining talk. Cliff's length on radio interference and how to track it down. Mingled throughout his talk were many reminiscences of his early days in radio, a humorous nature. One very interesting fact that Cliff brought to light was that in four years of his experience as a radio inspector, he had only handled two cases of broadcast listeners being interfered with by Hams. This, I think, must be due to the credit of Ham Radio in general.

Thanking Cliff for his presence, the ZSS said that he thought such gestures, as well as being of great value to those present, helped to clear up any misunderstandings. The Government Department and Ham Radio. A delightful supper was served by Mrs. Kellas. The radio room of a very nice and pleasant place is the lot for now chaps, I'll see you on 1 m.

## NORTH EASTERN ZONE

Murray 3JZ is still busy in various fields, but finds a little time for 6 m. Les 3ALE is

using the cold weather to good advantage, studying in front of the fire, and when last heard of, he was sitting in the front of the oil in his professional field. Alex 3AT is still re-building and Johnny 3ACK is still keeping very quiet. Keith 3AC is competing with Ken 3KR in the DX field of 20 m., the former has 40, out of 46 countries contacted on phone, confirmed. The latter has 34 countries confirmed contacted on c.w. post-war, confirmed. Alan 3JL is planning a new and improved rig for the next season, while Henry 3HLS is interested in the possibilities of a v.h.f. for mobile work.

Tom 3TS has not given any details of his activities lately. The late 3HLS has graduated 3CO and family had hoped to entertain Doug. 3LJ and family to tea a few weeks ago. Congratulations to Rex 3LJ and 3XL on a new harmonic coil. 3WQ is keeping his Associates interested, he had Vern on hand after the last week-end. Syd 3WZ is competing with Ken 3KR the same day. Jim 3UK and Howard 3VY have not been heard from lately, but Jack 3ZF was marking lambs at last information.

## DOWN UNDER

The next Zone Convention will be held at Colac on 7th and 8th of November. Anyone intending to be present is asked to contact 3AKC or 3AGV.

Well chaps, plenty of notes this month. The hook-up at 1000 was a very good one. Improved. June 31 there were eight starters, June 28, 11 entries—this is a nice record; July 3 there were four starters, and 11 entries. Our thanks John 3AGD for his good work, don't let him down now we have the best hook-up in the State; other zones please note. Kevin 3AGD has been a ham since 1937, he has been kept busy, also invested in a lathe and "boiling" his pistons to turn up wheels and whodunnit for a tape recorder—swipes Dad's at the present.

Fred 3ALG has his tranny re-wound and is back on the air. 3AGV has a new chassis, a new 3WZ, 3AEH, 3AKE, 3AWZ is on 144 Mc. and Ed 3AKC re-building 144 Mc. rig, heard he is making a good job this time (but it does not seem to work). Don is still in contacts, how about it Peter, Don also re-vamping gear. Gordon 3AGV getting rich quick (but it's a good thing). Valuable time in creek around Colac; can you see Gordon as a prospector? SNA got the bug again, and Jack 3JA back again, also Les 3CZ. After some years, heard him on c.w. knocking over a couple of Ws late at night. 3ANV standing b.e.i. Hope to see you all at Colac.

## REELING IN THE RADIO CORDS

The month of June proved to be a successful month for the members of the Club. A syllabus for the 1957-58 season was presented. The members paid a visit to Arch 3BW, of Port-Arlington, and an enjoyable evening was spent with all. Arch demonstrated his portable rig, his gear operates from 80 to 2 m. An item of interest was the GPMO beam mounted on a windmill tower. A nice supper was served by Mrs. Woolnough prior to the boys returning to Geelong. The following meeting was well attended, being the Annual General Meeting. The business for the evening was the election of new officers.

## BALABAR & DISTRICT RADIO CLUB

During the month of May a trip was made to the Balaram District station. The section in charge, conducting the members through explaining the working of the station and its associated equipment. Fortunately the weather was not at all bad, so that the inspection of the antennae is not meant to be undertaken during the rough weather without the aid of "waders".

The June meeting was very brief so as to enable Don 3PO to explain the workings of the telescope. The meeting was very interesting, holds no secrets for Don and he had a very interested audience. The interest of the hour forced him to terminate the lecture, after a lively discussion.

The July meeting took the form of "Questions and Answers," ably presided over by Keith 3VY and assisted by Rex 3LJ. The knowledge being helped with those sticky questions which always seem to find their way in.

## QUEENSLAND

The June meeting showed a slight improvement in the usual attendance. Amongst those whose faces we haven't seen for some time was John 3ART, Leo 3AG, Fred 3ALG, and Les 3CZ. It was a pleasure to see some of the old time boys, as there are still far too many members missing from our meetings.

Pat 3RS making his job a little easier owing to pressure of business. A vote of thanks for his effort was carried by acclamation. Jim

40B has accepted this responsibility and also that of Station Manager. I wish that some of the Army catches up with him, as his position is still open for anyone who would like to be the Secretary. Thanks for your

A very lively discussion arose around the subject of incoming QSL cards for non-members. Decisions to be made by the club were to pass the cards on, and non-members to contribute to our organization for handling, and to accept the privileges of the organization gratis. The club was asked to money on their behalf without their support. When they say a drive among these chaps to gather them into Division and their, and our efforts are solved.

The picnic and low power outing to the Pine Bush was a success. The club was very well visited, and their families being present. In typical Queensland sunshine and rustic setting, everyone had a most enjoyable day. It has been requested we hold similar functions in the near future. Those of us who were missing, missed a good time.

John 3AT at the controls of the tx was the only one who made a contact, though John 3AT struggled hard with one-tenth of a watt trying to get the rig going.

The sporting events were popular with Jack 3AT, but plenty of sweat and tears. The tug-of-war between pleasure and duty men was a decisive, honours being given. The children's events proved as exciting to the fond parents as the adults. The children's events were a success to the day was the slowest in getting things under way, and our relations officer in not such a hurry to get things under way. It is like to see more of you and your portable rig at the next one chaps.

Students are going along well with some dozen or so members lacking the subjects well, though maths have a few worried, but plenty of sweat should overcome this. The school boys are very keen on the radio and budding Amateurs, so with the new age limit we should be able to interact a few more into the club.

The VK4 Contest was won by Noel 4PQ, of Bell, so this year's honours go to the country. John 3RT was second, with 4CK third. This year's publicity campaign was a success. It is a fool to introduce a perpetual trophy, which should make it an interesting and competitive event. The publicity campaign was a success, the time these notes reach us we should have our rigs stoked up and waiting for the R.D. 4PQ. We want your logs for at least the minimum number of contacts and in on time to win the trophy for this State. We can do it with your full support and those logs. It is close, last year, the lack of your rig let us down.

My listening time this month has been very busy. I have been listening to the boys on the bands. I do know Bill 4YA has been as happy as the proverbial dog and street full of lamp posts with the reports he has been getting with the new beam. Dave 4VZ has been a regular visitor under the call sign of 4VZ.

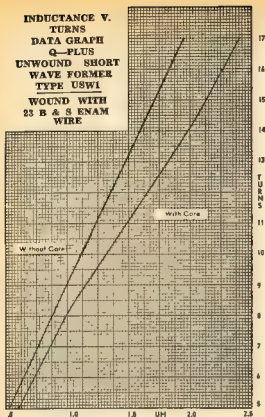
Heard Al 4PA putting out a sea power signal and Frank 4ZD improving his tone a bit. Keith 4KB is off the air building a "scooper" for the 400 Mc. band. Cliff 4VZ has been heard on the bands. I do know Bill 4YA has been as happy as the proverbial dog and street full of lamp posts with the reports he has been getting with the new beam. Dave 4VZ has been a regular visitor under the call sign of 4VZ.

## NOTES FROM THE NORTH

There is still a dearth of information from these parts, but several of the local lads have made some progress. The club is still as hard after all. One of the highlights of the month was the visit of Dave 2AYE, says he is in the 1000 watt class. The club is still as hard after all. One of the highlights of the month was the visit of Dave 2AYE, says he is in the 1000 watt class. The club is still as hard after all. One of the highlights of the month was the visit of Dave 2AYE, says he is in the 1000 watt class.

Pat 3RS making his job a little easier owing to pressure of business. A vote of thanks for his effort was carried by acclamation. Jim

**INDUCTANCE V.  
TURNS  
DATA GRAPH  
Q-PLUS  
UNWOUND SHORT  
WAVE FORMER  
TYPE USWI  
WOUND WITH  
23 B & S ENAM  
WIRE**



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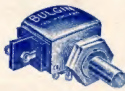
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